

Multidisciplinary Dental Treatment in the Patient under Therapy with Phenytoin: Case Report

Felipe Matheus Gomes¹, João Marcelo Ferreira de Medeiros², Rabbith Ive Carolina Shitsuka Risemberg³, Caleb Shitsuka⁴, Luiz Carlos Magno Filho⁵ and Irineu Gregnanin Pedron^{5*}

¹Undergraduate Student, Universidade Brasil, São Paulo, Brazil

²Professor, Department of Endodontics, Universidade Brasil, São Paulo, Brazil

³Postgraduate Student, Advanced Clinical Training in Restorative Dentistry, UCLA, USA

⁴Professor, Department of Pediatric Dentistry and Cariology, Universidade Brasil, São Paulo, Brazil

⁵Professor, Department of Periodontology, Implantology, Stomatology and Therapeutics, Universidade Brasil, São Paulo, Brazil

***Corresponding Author:** Irineu Gregnanin Pedron, Professor, Department of Periodontology, Implantology, Stomatology and Therapeutics, Universidade Brasil, São Paulo, Brazil, Tel: +55 11 2944-4067

Received: March 03, 2022 **Published:** March 14, 2022

Abstract

Patients who suffer convulsive crisis may require special care during dental treatment and can become a challenge to the dental surgeon. Seizure control usually occurs by systemic administration of anticonvulsant drugs, such as phenytoin, phenobarbital, carbamazepine, sodium valproate or valproic acid. These drugs usually have numerous systemic and stomatological adverse effects. Gingival overgrowth is one of the main consequences of the administration of these drugs, varying in size and extension according to each drug. Additionally, other lesions may affect patients with seizures, making treatment more complex. The purpose of this article is to present the case of a patient who suffered convulsive crisis and has been controlled by phenytoin administration. The patient developed gingival overgrowth due to the administration of phenytoin, which favored the development of periodontal disease. Due to trauma caused by the convulsive crisis, the patient presented fractured teeth with pulp necrosis, which caused the evolution of a cystic lesion. Endodontic, periodontal, surgical, regenerative and rehabilitative treatments of these complications were performed. The patient has been followed for 20 years. The treatments used improved not only the oral conditions but also the patient's quality of life and self-esteem.

Keywords: *Gingival Overgrowth; Phenytoin; Dental Assistance; Special Care in Dentistry.*

Introduction

Convulsive crisis are neurological alterations that may hinder or require special care in dental treatment. Usually, seizure control is achieved by systemic administration of anticonvulsant drugs, such as phenytoin, phenobarbital, carbamazepine and sodium valproate or valproic acid. Phenytoin is the main drug used for seizure control¹⁻⁶. Phenytoin is a weak acid, the drug of choice for the treatment of epilepsy and other seizure disorders of great evil, in the control of convulsions in patients victims of trauma in the posterior portion of the skull, in Reye's Syndrome, in some cases of neuritic pain, ventricular dysrhythmias and depression, exercising its properties by stabilizing nerve cell membranes to the action of Na, K and Ca ions. It also has an immunosuppressive action⁷⁻¹⁰. Several systemic and stomatological adverse effects may occur due to the administration of these drugs. Hair loss, hirsutism and acne are common adverse effects^{1,2,4}.

The development of gingival overgrowth is common in the oral cavity and is one of the main consequences of the administration of these drugs, as well as other drugs such as cyclosporine A, and antihypertensive drugs such as nifedipine and amlodipine. The clinical features, size and extent of gingival overgrowth depend on other factors such as the simultaneous occurrence of periodontal disease and the drug administered^{1-6,8,11-14}. Gingival overgrowth may affect aesthetics, speech, chewing, and hinder dental biofilm control, leading to the development of periodontal diseases and carious lesions^{3,6,13}.

Additionally, other lesions may affect the seizure patient, making treatment more complex and challenging. The planning and execution of each treatment is particular to each need. For gingival overgrowth, it is usually necessary to control dental biofilm and inflammation by basic periodontal treatment; and the surgical removal of gingival overgrowth, by gingivectomy technique. The substitution of the drug by an alternative is advised, being requested to the neurologist physician^{3,13,14}.

The purpose of this article is to present the case of a patient who suffered seizures and has been controlled by the administration of phenytoin. The patient developed gingival overgrowth due to the administration of phenytoin, which favored the development of periodontal disease. Due to trauma caused by the convulsive crisis, the patient presented fractured teeth with pulp necrosis, which caused the evolution of a cystic lesion. Endodontic, periodontal, surgical, regenerative and rehabilitative treatments of these complications were performed. The patient has been followed for 20 years. The treatments used improved not only the oral conditions but also the quality of life of the patient and self-esteem.

Case Report

A Caucasian male patient, 22-years-old, presented to the private clinic complaining of gingival overgrowth and dental trauma.

Clinically, the patient presented gingival overgrowth located in the region of the upper and lower anterior teeth, poor dental biofilm control associated with gingival inflammation; and fibrous fistula in the mucogingival line of tooth 21. Teeth 11, 21 and 22 were fractured (Figure 1).

Radiographically, diffuse periapical bone rarefaction was observed on teeth 21 and 22, possibly due to pulp necrosis caused by trauma to these dental elements (Figure 2).

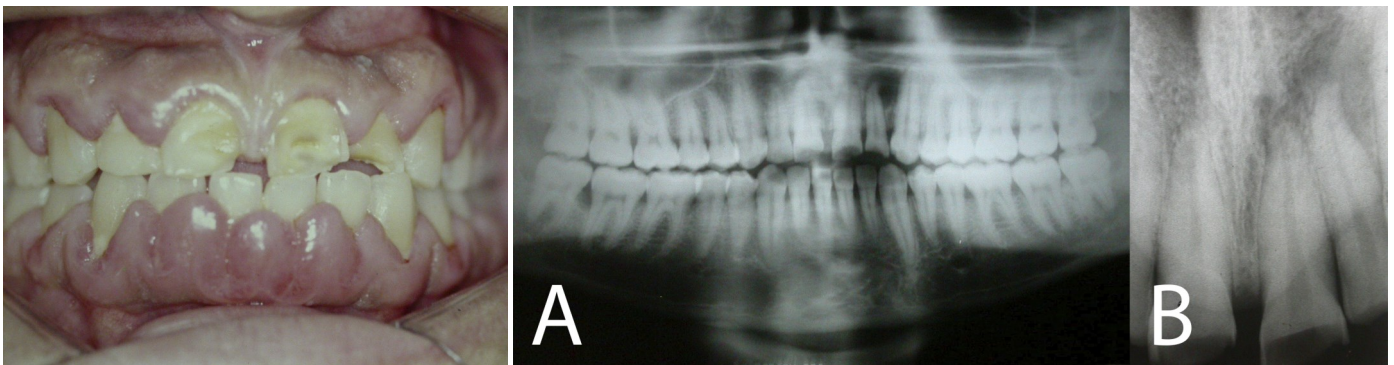


Fig 1: Initial clinical aspects: gingival overgrowth; teeth 11, 21 and 22 fractured.

Fig 2: Generalised radiographic view (A: panoramic radiograph). Periapical bone rarefaction on teeth 21 and 22 (B: periapical radiograph).

Regarding the medical history, seizures were reported 4 years ago, which were controlled with the administration of phenytoin, being responsible for the development of drug-induced gingival overgrowth. One year ago, due to the history of one of the seizures, trauma to the upper anterior teeth occurred.

A general evaluation of the patient was requested to the neurologist and the possibility of substitution of phenytoin by an alternative drug was requested in order to avoid recurrence of gingival overgrowth after its surgical removal. Phenytoin dosage was gradually reduced until total substitution by carbamazepine.

Initially, basic periodontal treatment was indicated, with oral hygiene instruction and sessions of scaling and root planing. The gingival overgrowth was removed by means of the gingivectomy technique, covering the region with surgical cement, which was removed after 14 days. The removed specimens (Figure 3) were fixed in 10% formalin and sent to the Laboratory of Surgical Pathology of the School of Dentistry of the University of São Paulo. The histopathological diagnosis was drug-induced gingival overgrowth.



Fig 3: Fragments of the removed lesion.

After the gingivectomy, endodontic treatment of teeth 21 and 22 was performed. Despite the trauma, tooth 11 did not require endodontic treatment. In the endodontic treatment, the calcium hydroxide-based cement was overflowed in order to reduce the pH and have an antibacterial effect, to restore the periapical region (Figure 4). Direct composite resin reconstructions were performed on the upper incisors (Figure 5).

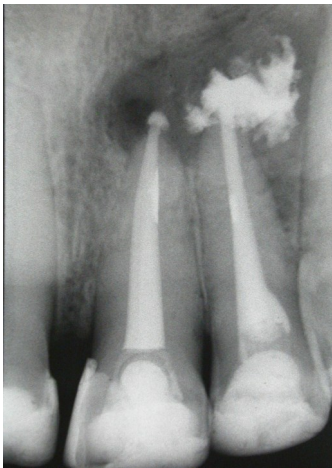


Fig 4: Calcium hydroxide-based cement overflowed during endodontic treatment.



Fig 5: Direct composite resin reconstructions performed on the upper incisors.

After 6 months of endodontic treatment, followed-up radiographically, unsatisfactory bone repair was observed in the periapical region. Surgery to remove the cystic lesion was suggested and, due to the size of the lesion, the use of platelet-rich plasma was recommended. The protocol to obtain peripheral blood and prepare of the platelet-rich plasma (Figure 6) was previously established by Marx et al.¹⁵ (1998). The cystic lesion was curetted and removed and platelet-rich plasma was inserted into the cavity. The final histopathological diagnosis was root cyst. The patient presented bone regeneration at the surgical site and has been followed for 20 years¹⁶ (Figure 7).

The patient has been followed for 20 years under periodontal control. No recurrences of periodontal disease, gingival overgrowth or cystic lesions were observed.

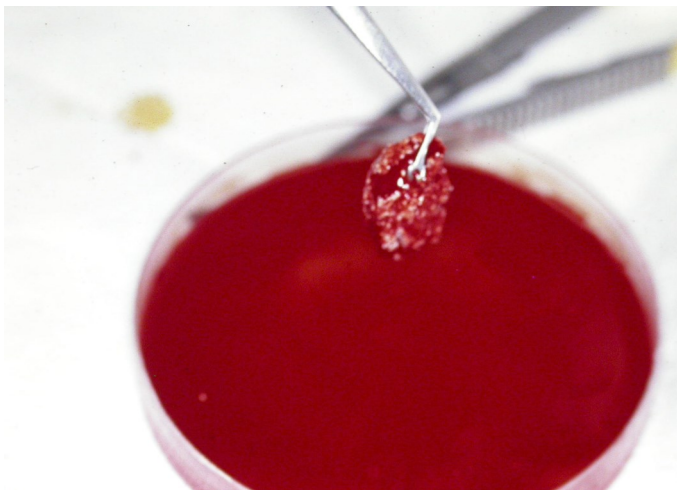


Fig 6: Obtaining and prepare of the platelet-rich plasma.



Fig 7: Bone regeneration at the surgical site after 20 years.

Discussion

Gingival overgrowth is one of the main stomatological complications resulting from the administration of anticonvulsant drugs, particularly phenytoin^{1-3,13,14}. Besides the special care given to patients with seizures, gingival overgrowth leads to the accumulation of dental biofilm and the development of periodontal diseases and carious lesions^{3,5,13,14}.

Drug-induced gingival overgrowth is clinically characterized by an asymptomatic increase in gingival tissue, which starts at the interdental papillae and affects all the keratinized gingiva. It is more common on the buccal surface, but can reach the palatal and lingual surfaces of teeth.

It may cover the coronal portion of the teeth, creating deep periodontal pseudopockets, making oral hygiene difficult and favouring the accumulation of biofilm and dental calculus. When it reaches larger dimensions, it may become symptomatic under chewing trauma^{3,5,6,8-10,17}.

Factors such as organismal susceptibility (genetic predisposition), drug associations, presence of dental biofilm and gingival inflammation may influence the prevalence and severity of lesions^{3,5,7-10,13,17,18}.

The treatment of gingival overgrowth includes the control of dental biofilm, by means of oral hygiene instruction and periodontal treatment, reducing the incidence and severity of lesions. Subsequently, it may be necessary to institute surgical periodontal treatment (gingivectomy, flap surgery, laser)^{3,5,8-10,12,14,18}. Systemic administration of antibiotics has proved ambiguous, presenting positive and negative results. However, long-term administration is undesirable¹⁴. The possibility of substitution of the drug with an alternative may help lesion regression or non-recurrence after treatment⁹. In the present case, phenytoin was substituted by carbamazepine by the neurologist physician.

Several factors may indicate the possibility of recurrence. Age, poor oral hygiene, periodontal disease, and continued use of drugs may be responsible for the recurrence of gingival overgrowth^{8,9,11,13,14}. In this case report, treatment success may have been determined by the institution of adequate treatment, periodontal control and substitution of medication by the neurologist physician, following the case and showing no signs of recurrence for 20 years.

Regarding special care for patients who suffer a convulsive crisis, it is imperative to institute a prophylactic antibiotic protocol (American Heart Association) to reduce the risks of dissemination of bacteremia and infection, as we have done. If a convulsive crisis occurs during dental care, the patient must be encouraged to breathe and to move freely to improve the comfort of the patient with muscle spasms. Objects must be removed from the oral cavity of the patient. If there is excessive salivation during a seizure, aspiration may be recommended^{19,20}. Patients who suffer seizures may generally present hard tissue trauma and soft tissue lacerations²⁰. The present case showed the evolution of a cystic lesion due to pulp necrosis after trauma to the anterior maxillary teeth. Other rehabilitative treatment (restorations and prostheses) and orthodontic treatment should be performed preferably under seizure control²⁰.

Conclusions

The care inherent to the patient who suffers convulsive crises must be particularized. Initially, the interaction between physician and dental surgeon is fundamental, in an attempt to substitute the anticonvulsant drug for one that does not cause gingival overgrowth. Basic and surgical periodontal treatment will be performed in cases of gingival overgrowth, and periodontal control should be rigorous, avoiding the recurrence of lesions, monitoring patients longitudinally.

Conflict of Interest

The authors declare no conflict of interest.

References

1. Asadi-Pooya AA, Rostaminejad M, Zeraatpisheh Z, Damabi NM. Cosmetic adverse effects of antiseizure medications; A systematic review. *Seizure* 2021;91:9-21.
2. Gallo C, Bonvento G, Zagotto G, Mucignat-Caretta C. Gingival overgrowth induced by anticonvulsant drugs: A cross-sectional study on epileptic patients. *J Periodontol Res* 2021;56(2):363-369.
3. Chacko LN, Abraham S. Phenytoin-induced gingival enlargement. *BMJ Case Rep* 2014;2014:bcr2014204670.
4. Hatahira H, Abe J, Hane Y, Matsui T, Sasaoka S, Motooka Y, Hasegawa S, Fukuda A, Naganuma M, Ohmori T, Kinosada Y, Nakamura M. Drug-induced gingival hyperplasia: a retrospective study using spontaneous reporting system databases. *J Pharm Health Care Sci* 2017;3:19.
5. Kara C, Demir T, Tezel A. Effectiveness of periodontal therapies on the treatment of different aetiological factors induced gingival overgrowth in puberty. *Int J Dent Hyg* 2007;5(4):211-217.
6. Mohan RPS, Rastogi K, Bhushan R, Verma S. Phenytoin-induced gingival enlargement: a dental awakening for patients with epilepsy. *BMJ Case Rep* 2013;2013:bcr201308679.
7. Garzino-Demo P, Carbone M, Carrozo M, Broccoletti R, Gandolfo S. Aumento di volume gengivale idotto da farmaci (fenitoina, ciclosporina, e calcioantagonisti). *Minerva Stomatol* 1998;47(9):387-398.
8. Hallmon WW, Rossmann JA. The role of drugs in the pathogenesis of gingival overgrowth. *Periodontol* 2000 1999;21:176-196.
9. Marshall RI, Bartold PM. A clinical review of drug-induced gingival overgrowths. *Aust Dent J* 1999;44(4):219-232.

10. Rees TD. Drugs and oral disorders. *Periodontol 2000* 1998;18:21-36.
11. Ilgenli T, Atilla G, Baylas H. Effectiveness of periodontal therapy in patients with drug-induced gingival overgrowth. Long-term results. *J Periodontol* 1999;70(9):967-972.
12. Inglés E, Rossmann JA, Caffesse RG. New clinical index for drug-induced gingival overgrowth. *Quintessence Int* 1999;30(7):467-473.
13. Zoheir N, Hughes FJ. The management of drug-influenced gingival enlargement. *Prim Dent J* 2020;8(4):34-39.
14. Mavrogiannis M, Ellis JS, Thomason JM, Seymour RA. The management of drug-induced gingival overgrowth. *J Clin Periodontol* 2006;33(6):434-439.
15. Marx RE, Carlson ER, Eichstaedt RM, Schimmele SR, Strauss JE, Georgeff KR. Platelet-rich plasma: growth factor enhancement for bone grafts. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1998;85(6):638-6.
16. Mendes JF, Di Francesco ERS, Dáguila CH, Maia MC, Maia MDLP, Pedron IG. The platelet-rich plasma use after enucleation of cystic lesion resulting from pulpal necrosis due to dental trauma: 20-years follow-up. *SVOA Dentistry* 2022;3(2):75-80.
17. Kamali F, McLaughlin WS, Ball DE, Seymour RA. The effect of multiple anticonvulsant therapy on the expression of phenytoin-induced gingival overgrowth. *J Clin Periodontol* 1999;26(12):802-805.
18. Thomason JM, Seymour RA, Rawlins MD. Incidence and severity of phenytoin-induced gingival overgrowth in epileptic patients in General Medical Practice. *Community Dent Oral Epidemiol* 1992;20(5):288-291.
19. Sanders BJ, Weddell JA, Dodge NN. Managing patients who have seizure disorders: dental and medical issues. *J Am Dent Assoc* 1995;126(12):1641-1647.
20. Fiske J, Boyle C. Epilepsy and oral care. *Dent Update* 2002;29(4):180-187.

Citation: Gomes FM, de Medeiros JMF, Risemberg RICS, Shitsuka C, Filho LCM, Pedron IG. "Multidisciplinary Dental Treatment in the Patient under Therapy with Phenytoin: Case Report". *SVOA Dentistry* 3:2 (2022) Pages 101-105.

Copyright: © 2022 All rights reserved by Pedron IG., et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.